

Potential "Core Actions"

(Which could be part of any alternative)

An action is an activity that is intended to address a problem or resolve a conflict in the Bay-Delta system. An action could be a structure, operating criteria, a program, a regulation, a policy, or a restoration activity. The list of action categories and actions identifies actions that the CALFED Bay-Delta Program will consider to meet Program objectives to solve problems or contribute to solutions in the Bay-Delta system. The list currently includes approximately 230 actions.

Some of these 230 actions may be considered for inclusion in all alternatives. This concept of a set of **"core actions"** that could be included in all alternatives was explored during the Public Workshop on December 4, 1995. A set of "core actions" could provide early benefits to the Program. With appropriate support and funding (e.g. S.B.900), such a set of actions could be used to begin early implementation before all Program elements are outlined. The workshop participants suggested several types of actions for consideration as "core actions", but the magnitude of each remains to be defined:

- Habitat restoration
- Levee maintenance and stabilization
- Demand management
- Water transfer flexibility and efficiency

During the PCT meeting on December 12, 1995, we would like to further explore the concept of developing a set of "core actions" and how the levels (how much?) of each action could be defined. For example, should levee maintenance and stabilization be conducted, 1) at a level that maintains the existing level of risk, or 2) provide additional protection for water supply, or 3) provide additional protection for habitat, land use, etc.?

The Program team also considered potential "core actions" during the initial process of assembling actions into preliminary alternatives. A similar set of actions reappeared for many of the preliminary alternatives. The following list of potential "core actions" is presented for further consideration by the PCT:

- Restore and enhance existing wetlands
- Protect existing wetland habitat
- Improve regulation of ballast-water releases
- Improve border inspection practices
- Modify gravel mining practices
- Use real-time monitoring and adaptive management
- Operate fish barrier on San Joaquin River at Merced River
- Establish incentives for conjunctive use
- Modify California Water Code to ease water transfers

- Improve procedures for transfer permitting
- Coordinate diversion and conveyance of transfers
- Establish incentives for long-term planning
- Conduct integrated resources planning
- Establish incentives for long-term conservation
- Develop alternative supplies for drought situations
- Develop Water Resources Data and Information Management
- Coordinate multi-agency roles in resource management
- Coordinate groundwater/surface water management
- Establish incentives for cooperation/coordination for water management planning
- Establish a public awareness/education program for water management
- Encourage local determination of water supplies that are available
- Encourage local assessment of water supply reliability
- Integrate the development of wastewater discharge requirements into water quality planning
- Integrate the development of toxic discharge requirements from industrial plants into water quality planning
- Maintain and stabilize existing levees
- Implement uniform levee maintenance standards
- Provide funding for maintenance and stabilization of levees

Selection Philosophy for Basic Alternative Development

Two levels (basic and maximum) were used to begin development of preliminary boundary alternatives to help bracket the potential range of alternatives. The following guidelines were developed to define a minimum level of conflict resolution. A basic alternative should provide enough benefits to assure that:

- Winter-run chinook salmon and Delta smelt are not in danger of extinction
- Water supplies do not face regulatory uncertainties caused by take limits
- Additional species are not listed as threatened or endangered
- The solution principle for equity is satisfied (i.e. benefits are fairly distributed across the range of objectives).

The above are assumed to be in addition to the Delta Accord adopted on December 15, 1994 and the State of California Water Quality Control Plan.

In addition to this minimal level of conflict resolution, other core actions (described above) were added to each basic alternative. These included the following:

- Levee management (maintenance at existing levels of protection)
- Habitat protection (of existing values in the Bay-Delta system)
- Implementation of a basic level of demand management¹ including conservation (universal with respect to geography and beneficial use) and
- Source control of pollutants

¹ Demand management actions will be incorporated in every alternative to some level of implementation. Sensitivity analysis will be performed to determine the extent to which the components of the alternative are influenced by those actions.

Preliminary Boundary Alternative # 6

Corresponding to Solution Strategy 1A, 2A, 3B, 4B (Basic)

The following preliminary boundary alternative description is provided as an example of a basic alternative developed with the above philosophy.

Primary Conflict	Approach to Resolve Conflict
Fisheries and Diversions (Conflict 1)	Increase Fish Productivity (1A) Diversion Modification (1B)
Habitat and Land Use/Flood Protection (Conflict 2)	Preserve Existing Land Use (2A) Create Additional Habitat Area (2B)
Water Supply Availability and Beneficial Uses (Conflict 3)	Reduce Critical Export Area Demands (3A) Enhance Delta Supplies as Inflows (3B)
Water Quality and Land Use (Conflict 4)	Managing Quality of Delta Inflow (4A) Manage Instream/In-delta Water Quality (4B)
Basic or Maximum	

Solution Overview

This solution strategy consists of actions that increase fish populations through the protection and enhancement of existing habitat. Water supply flexibility is primarily enhanced by increases in supply north of the Delta. As this is a minimum strategy, increases in supply are derived primarily through better long term planning and management leading to improved utilization of the existing supply.

Actions Selected

Habitat - This alternative is characterized by actions to protect or enhance existing wetland and terrestrial habitat, including the modification of construction practices to include riverine elements, modifying levee maintenance practices with respect to vegetation and habitat, and improved management of upstream flows and temperatures.

Populations - Actions to enhance populations are limited to the construction of barriers to protect fish from harm, the removal of barriers to fish spawning, and other modifications that would improve passage obstacles.

Diversion Modifications for Fisheries - None

Water Use - Water supply is enhanced through institutional and regulatory actions to create incentives for water transfers and conjunctive use, improved long term planning and facilitation of water transfers by simplifying and coordinating procedures.

Water Quality - Water quality is improved by institutional actions that increase urban awareness regarding water quality issues, and in-stream actions, including coordinating the development of wastewater discharge with water quality planning, and coordinating the prevention of toxic discharge with water quality planning.

Land Use/Levees/Flood Protection - Under this alternative levee maintenance would be funded and conducted using uniform standards that would maintain and stabilize existing levees.

Institutional - Institutional coordination would be required to better conduct long range planning and facilitate water transfers.

Preliminary Assessment

This alternative's implementation would achieve modest improvements in water supply and minor enhancement of existing Delta habitat. It would not likely ensure ESA compliance or substantially increase the reliability of Delta supplies. A key deficiency is that supply enhancements do not include additional storage and conjunctive use strategies that could be used for water supply and environmental benefits.

Selection Philosophy for Maximum Alternative Development

Two levels (basic and maximum) were used to begin development of preliminary alternatives to help bracket the potential range of alternatives. The following guidelines were developed to define a maximum level of conflict resolution:

- Include all actions which are allowed by the particular solution strategy under consideration except where a choice must be made between two incompatible actions.
- Also include all core actions, whether or not they are allowed by the particular solution strategy under consideration.

Like the basic philosophy, the above are assumed to be in addition to the Delta Accord adopted on December 15, 1994 and the State of California Water Quality Control Plan.

In addition to this basic level of conflict resolution, other "core actions" for maximum level of implementation of Program solutions were used. These included the following:

- Levee management (reconstruction, restoration, or structural improvements to maintain and increase existing levels of protection)
- Habitat protection of existing values in the Bay-Delta system and maximum levels of habitat enhancement.
- Implementation of a maximum level of demand management¹ (practiced in all areas but with special emphasis in areas tributary to the Delta), including conservation (universal with respect to geography and beneficial use)
- Enhancement of water supplies to the Delta through a variety of actions, and
- Improvement of Delta water quality through increased management of instream water quality, including dilution, treatment, and more rigorous enforcement of surface water quality regulations.

¹ Demand management actions will be incorporated in every alternative to some level of implementation. Sensitivity analysis will be performed to determine the extent to which the components of the alternative are influenced by those actions.

Preliminary Alternative # 22

Corresponding to Solution Strategy 1A, 2A, 3B, 4B (Maximum)

The following preliminary boundary alternative description is provided as an example of a maximum alternative development with the above philosophy.

Primary Conflict	Approach to Resolve Conflict
Fisheries and Diversions (Conflict 1)	Increase Fish Productivity (1A) Diversion Modification (1B)
Habitat and Land Use/Flood Protection (Conflict 2)	Preserve Existing Land Use (2A) Create Additional Habitat Area (2B)
Water Supply Availability and Beneficial Uses (Conflict 3)	Reduce Critical Export Area Demands (3A) Enhance Delta Supplies as Inflows (3B)
Water Quality and Land Use (Conflict 4)	Managing Quality of Delta Inflow (4A) Manage Instream/In-Delta Water Quality (4B)
Basic or Maximum	

Solution Overview

This solution strategy includes actions that increase fish populations through habitat enhancement, elimination of barriers to fish migration, expanded and improved hatchery operations, and improved water quality. Habitat enhancement focuses on improved management and restoration of existing habitat, rather than the creation of additional habitat, especially where such creation would affect existing land uses. Increased water supply is achieved by increases in supply north of the Delta through either the reoperation of existing storage or creation of new storage. Preservation of existing land use and the protection of levees is a central element of this strategy.

Actions Selected

Habitat - This alternative is characterized by actions to improve existing habitat within and upstream of the Delta and control of tributary flows and temperature.

Populations - Actions to increase populations include restoration and improved management of habitat areas, increased capacity for fish hatcheries and elimination of barriers to migration.

Diversion Modifications for Fisheries - No actions related to the utilization of diversion as a management tool are indicated with this solution strategy.

Water Use - Water supply enhancement actions including increased storage, conjunctive use, and improved resource management (e.g., facilitated water transfers) are available actions.

Water Quality - Instream water quality improvement actions include dilution and phasing of discharges rather than reduction or control of source discharges.

Land Use/Levees/Flood Protection - Existing land use would be preserved through improvements in levee maintenance practices and reconstruction of levees where appropriate.

Institutional - A broad range of institutional measures are available, including education, regulatory reform, and the designation of a single administrative agency to assist in coordination of water resources management.

Preliminary Assessment

This alternative's implementation would achieve improvements in existing Delta habitat, but limited increase in the areal extent of usable habitat. Water supply reliability would be increased substantially through the addition of upstream and in-Delta storage and conjunctive use. The weakness in this alternative derives from the lack of synergistic benefits (to water supply and fish populations) that would accrue from coupling the additional storage with improved diversion and flow pattern management within the Delta.

Performance Measures

The "performance" of an alternative with respect to CALFED Bay-Delta Program objectives will be evaluated in the alternative generation phase and screening phase of alternative analysis. This "performance" needs to be defined in a systematic way to help identify ways to improve the preliminary alternatives, to synthesize new alternatives, and to finally determine an acceptable short list of alternatives. That "performance" is defined using "Performance Measures"--measurable indices for how well an alternative satisfies a Program objective. The following pages describe the current set of nine performance measures (PMs). These PMs have been developed in a process, starting from the set of Program problem statements and associated Program objectives, which were then developed into measurable indices.

The PMs must be developed so that each action in a particular alternative and the alternative as a whole can be evaluated against the Program objectives. Therefore, the actions that comprise an alternative must be specific enough to allow evaluation by the PMs and the PMs must be general enough to evaluate each action. In the long term, PMs will measure performance of the total alternative, at this stage they will measure the actions in an alternative. This will help in the selection of the most promising actions to include in alternative development.

As the Program progresses, the PMs and actions will co-evolve. That is, as the alternatives are refined and the actions become better specified, the PMs can be made more specific. In turn, the more specific the PMs are the more specific the guidance that is provided on how to refine the alternatives. At this stage, the actions comprising the alternatives are quite general, so the PMs must be applicable to a very general level. In fact, those PMs assess each action in terms of its potential to contribute to achieving a Program objective, or more specifically, its potential to contribute to achieving some maximum achievable benefit identified as part of a PM.

In the current process, each PM is associated with several specific benefits. The following seven figures present the current status of nine (two are in progress) PMs. Each figure presents the benefit categories and an explanatory narrative for a PM.

The name of the PM for the listed objective is shown in the top box. The maximum benefits that can be derived for that objective are then allocated to a geographical area in the second layer of boxes. Then, the benefits to be derived for that geographical area are allocated among a number of contributing factors. In some PMs this order is reversed. These geographical areas and their contributing factors are an attempt to get

the PMs to the level of detail to evaluate the actions in an alternative. Both will be refined as the Program progresses.

To score the benefits of a action to meet an objective, percentage points can be allocated between the geographical areas as well as their contributing factors. For example, in the Aquatic Habitat PM, a percentage may be given to the maximum achievable level of benefit of 60 percent to habitat in the Delta and 40 percent upstream of the Delta. In the Delta the contributing factors may be given a percentage of maximum achievable benefit of 20 percent for shaded and shallow water habitat area, 40 percent for entrainment protection actions, 20 percent for estuarine salinity and entrapment zone management, and 20 percent for eliminating existing toxicity effects. Both the geographical and the contributing factors must add to 100 percent. **Keep in mind these are just place holder percentages until the expert review is accomplished.**

In the next step of the process each action in an alternative is scored from 0 to 100 percent on how well it could achieve a the maximum benefit for a contributing factor in the particular setting. The actions total score for that PM would be the multiplication of this score times all the percentages on the path upward to the objective. For example, in the Aquatic habitat PM, if the action can satisfy 100 percent of the contributing factor, the score would be .24 ($1.00 \times .4 \times .6$). If the action satisfied other contributing factors the score would be computed for the percentage in the same manner and then added.

An alternative is scored with nine numbers, one for each PM. Its score on each PM is simply the sum of the scores its action receives on that PM. Alternatives can then be compared by comparing their nine numerical PM scores. Graphical devices, such as nine-bar graphs, can aid the comparison process. The PM set is still under development, so there could be more PMs developed or more detail developed in each of the scoring levels.

The PCT is asked to review the PMs with the following questions in mind:

- Do the nine PMs (two in progress) represent the Program's primary objectives?
- At the various levels of benefit allocation are the components representative enough to allocate the benefit.? (More or less needed?) (Do they add better definition?)
- What are the appropriate percentages for each of the contributing factors?